

REMARKS

At the time of the Office Action dated March 21, 2007, claims 1-10 are pending in this application. In this Amendment, claim 1 has been amended, and claim 4 canceled. The specification has also been amended. Care has been exercised to avoid the introduction of new matter. Specifically, claim 1 has been amended to include all the limitations recited in claim 4. In the specification, reference to "Fig. 1" in the paragraph beginning at page 16, line 19 has been amended to --Fig. 2--, because the paragraph amended describes the tenth step in which submount 3 without laser diode 2 is obtained (see Fig. 2), while the subsequent paragraph describes the eleventh step in which laser diode 2 is mounted on submount 3 (see Fig. 1).

Claims 1-3 and 5-10 are now active in this application, of which claim 1 is a solo independent claim.

Claims 1-10 have been rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement.

In the statement of the rejection, the Examiner asserted, "The surface roughness, Ra, of at most 0.18 μm in the final structure is not disclosed by the specification." This rejection is respectfully traversed. It is noted that the rejection of claim 4 has been rendered moot by cancellation of the claim.

In rejecting a claim under the first paragraph of 35 U.S.C. §112 for lack of adequate descriptive support, the Examiner is charged with the initial burden of establishing that one having ordinary skill in the art would not have reasonably recognized from the originally filed disclosure that an applicant had possession of the claimed invention. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). That burden has not been discharged by merely asserting a

lack of *ipsis verbis* support in the specification for claim language. *Wang Laboratories, Inc. v. Toshiba Corp.*, 993 F.2d 858 26 USPQ2d 767 (CAFC 1993). Rather, the issue generated by a rejection under the first paragraph of 35 U.S.C. §112 for lack of adequate descriptive support is whether the concept embodied in a claim was originally disclosed. *In re Anderson*, 471 F.2d 1237, 176 USPQ 331 (CCPA 1973). It has been repeatedly held that the written description requirement does not require an Applicant to describe exactly the subject matter claimed. Rather, the disclosure should be sufficient to allow one having ordinary skill in the art to recognize that an applicant invented what is being claimed. *Union Oil Co. of California v. Atlantic Richfield Co.*, 54 USPQ2d 1227 (Fed. Cir. 2000); *In re Gosteli*, 872 F.2d 1008, 10 USPQ2d 1615 (Fed. Cir. 1989).

In applying the above legal tenets to this case, Applicants submit that the Examiner did not establish a *prima facie* basis to deny patentability to the claimed invention under the first paragraph of 35 U.S.C. §112 for lack of adequate descriptive support. Specifically, the Examiner asserted that claims 1-10 fail to comply with the written description requirement because “The ‘surface roughness, Ra, of at most 0.18 μm before the solder layer is melted’ [is] disclosed by the specification,” but “The surface roughness, Ra, of at most 0.18 μm in the final structure is not disclosed by the specification” (see the second full paragraph on page 2 of the Office Action). However, Applicants submit that persons skilled in the art can appreciate that the final structure of the submount is disclosed in light of the specification and drawings.

For example, the third full paragraph on page 16 describes, “The tenth step is to cut the substrate prepared in the first step on the surface of which the specified structure is formed as described above,” and “After the cutting, the submount 3 shown in Fig. 2 is obtained” (emphasis added). The paragraph bridging pages 16 and 17 describes, “The eleventh step is to bond the

laser diode 2 as a semiconductor light-emitting device to the submount 3" and "First, the solder layer 8 is melted by heating." The subsequent paragraph on page 17 further states, "The laser diode 2 is placed on the solder layer 8 judged to be molten" and "This completes the production of the semiconductor unit 1 shown in Fig. 1." Accordingly, persons skilled in the art can understand that submount 3 after the tenth step is, for example, an intermediate product having the final structure as a submount (see reference numeral 3 in Fig. 2).

It is also apparent that the disclosure describes submount 3 after the tenth step has a surface roughness, Ra, of at most 0.18 μm . The paragraph bridging pages 16 and 17 describes the eleventh step in which solder layer 8 is melted by heating, and then, laser diode 2 is mounted on solder layer 8. The paragraph bridging pages 17 and 18 further discloses, "the surface 8f of the solder layer 8 has a surface roughness, Ra, as small as 0.18 μm before it is melted..." (emphasis added). It can be understood that melting solder layer 8 is performed in the eleventh step. Accordingly, persons skilled in the art can understand that submount 3 after the tenth step has a surface roughness, Ra, of at most 0.18 μm . Therefore, the specification describes that the submount in the final structure has a surface roughness, Ra, of at most 0.18 μm .

Clearly, persons skilled in the art would have recognized from the originally filed disclosure that Applicants have possession of the now claimed invention. Applicants, therefore, submit that the imposed rejection of claims 1-10 under the first paragraph of 35 U.S.C. §112 for lack of adequate descriptive support is not viable and, hence, respectfully solicits withdrawal thereof.

Claims 1-4 and 6-8 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Slater, Jr. et al. (“Slater”) in view of Shizuki et al. (“Shizuki”).

In the statement of the rejection, the Examiner asserted as follows:

Slater, Jr. et al. discloses a submount comprising a submount substrate (75), a solder layer (80) formed on the top surface of the submount substrate, and a semiconductor light-emitting device (100) mounted on the solder layer. Note paragraph [0061] of Slater. Shizuki further teaches that the surface roughness of the solder layer is less than 0.18 μm . Note lines 55-58, column 9 of Shizuki et al. Therefore, it would have been obvious to one of ordinary skill in the art to use the teachings of Shizuki to form a surface roughness of the solder layer being less than 0.18 μm in Slater’s device.

Applicants submit that the Examiner did not provide any reason why a person skilled in the art would have been motivated to modify Slater’s device to arrive at the claimed invention. In imposing a rejection under 35 U.S.C. §103, the Examiner is required to make a “thorough and searching” factual inquiry and, based upon such a factual inquiry, explain why one having ordinary skill in the art would have been realistically impelled to modify Slater’s device to arrive at the claimed invention. *In re Lee*, 277 F.3d 1338, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002).

Merely identifying features of a claimed invention in disparate prior art references does not, automatically, establish the requisite motivation for combining references in any particular manner. *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999); *Grain Processing Corp. v. American-Maize Products Co.*, 840 F.2d 902, 5 USPQ2d 1788 (Fed. Cir. 1988). The Supreme Court noted, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. ___, slip op. at 15 (April 30, 2007).

In applying the above legal tenets to this case, it is apparent that the Examiner has not established the requisite motivational element because the Examiner identified elements in the references as the claimed elements, and then, simply stated that it would have been obvious to

modify Slater's device based on Shizuki to arrive at the claimed invention without any comments regarding the requisite motivation. Therefore, the Examiner did not "identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *Id.*

Applicants further submit that the applied combination of Slater and Shizuki does not teach a submount including all the limitations recited in independent claim 1. Specifically, the applied combination does not teach, at a minimum, "a solder layer that ... has an average crystal-grain diameter of at most 3.5 μm ," recited in claim 1.

In the statement of the rejection, the Examiner, referring to Shizuki in column 9, lines 55-58 (reproduced below), asserted that the reference teaches "a solder layer that ... has a surface roughness, Ra, of at most 0.18 μm ."

Generally, the surface roughness of the wiring board 14 is 100 nm or more, but the surface roughness of the solder portion 15₁ is 20 nm or less to provide a mirror-like surface, and therefore, they can be distinguished from each other based on a difference in the reflectance. Thus, the connection inspection for the solder 15₁ can be easily effected.

The cited paragraph apparently shows that Shizuki does not teach, at a minimum, "an average crystal-grain diameter of at most 3.5 μm ," as claimed. The reference simply describes surface roughness is 20 μm after melted. Alter the solder layer is melted, the surface roughness become small (the surface becomes smooth). On the other hand, in the claimed subject matter, the surface of the solder layer becomes smooth (small surface roughness) before the layer is melted, i.e., a submount as a final product. In addition, there is no description about an average crystal-grain diameter in Shizuki. Usually, when a solder layer is melted and becomes solid after it is melted, it is known that an average crystal-grain size becomes 100 μm or more. In contrast,

claim 1 recites that a solder layer has an average crystal-grain diameter of at most 3.5 μm . It is noted that Slater is silent on the claimed average crystal-grain diameter.

Based upon the foregoing, Applicants submit that the Examiner has not established a *prima facie* basis to deny patentability to the claimed invention for lack of the requisite realistic motivation. Moreover, Slater and Shizuki, either individually or in combination, do not teach a submount including all the limitations recited in independent claim 1, as well as those recited in dependent claims 2, 3, and 6-8. It is noted the rejection of claim 4 has been rendered moot by cancellation of the claim. Applicants, therefore, respectfully solicit withdrawal of the rejection of the claims under 35 U.S.C. §103 and favorable consideration thereof.

Claims 5 and 10 have been rejected under 35 U.S.C. § 103 as being unpatentable over Salter in view of Shizuki and further in view of Hikasa et al. (“Hikasa”) and Kitaoka et al. (“Kitaoka”).

Since claims 5 and 10 depend from independent claim 1, Applicants incorporate herein the arguments previously advanced in responding to the rejection of independent claim 1 under 35 U.S.C. §103 for obviousness predicated upon Slater in view of Shizuki. The Examiner’s additional comments and reference to Hikasa and Kitaoka do not cure the previously argued deficiencies of Slater. Accordingly, even if the applied references are combined as suggested by the Examiner, the applied combination does not teach a submount including all the limitations recited in claims 5 and 10.

Applicants, therefore, respectfully solicit withdrawal of the rejection of claims 5 and 10, and favorable consideration thereof.

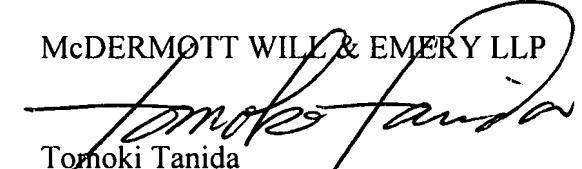
Conclusion

It should, therefore, be apparent that the imposed rejections have been overcome and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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